

New York Independent System Operator Inc.

New York Capacitor/Phasor Measurement Project

Abstract

New York Independent System Operator (NYISO) and eight transmission owners are deploying synchrophasor technologies and smart grid-enabled capacitors across the New York Control Area's transmission system. The project aims to improve the reliability of the transmission grid and prevent the spread of local outages to neighboring regions through enhanced monitoring capabilities. The transmission owner partners in this project are deploying phasor measurement units (PMUs) and phasor data concentrators (PDCs). New transmission capacitor banks increase the ability of grid operators to regulate transmission voltages. The project deploys software to assist in determining real-time grid stability margins. Goals include increasing a grid operator's visibility of bulk power system conditions in near-real time, enabling earlier detection of disturbances that could result in instabilities or outages, and facilitating the sharing of synchrophasor information with neighboring regional control areas. Access to better system operating information also helps NYISO engineers to improve power system models and analytical techniques, and provides additional tools to improve the overall reliability of the NYISO system.

Smart Grid Features

Communications infrastructure includes deployment of networked systems to access, store, and process data from PMUs and PDCs and to share collected data across the participating utilities and the NYISO grid operations center.

Wide-area monitoring, visualization, and control system enables a more expansive view of the bulk transmission system, while revealing dynamic operating details. NYISO expects that access to this detailed, real-time data to enable transmission operators to identify grid disturbances at an early and localized stage. NYISO and the project partners view this capability as a potential key safeguard against future wide-scale blackouts, such as the major outage that affected NYISO and neighboring control areas in August 2003.

Through the project, NYISO is implementing **advanced transmission applications** for the synchrophasor system, including:

- **Post-mortem analysis** enables power system engineers and grid operators to analyze disturbances and large-scale system events, to better understand their causes and to improve future system models and operations.

At-A-Glance

Recipient: New York Independent System Operator
State: New York
NERC Region: Northeast Power Coordinating Council
Total Budget: \$75,710,733
Federal Share: \$37,828,825
Key Partners: New York Power Authority, National Grid, New York State Electric & Gas, Orange & Rockland Utilities, Long Island Power Authority, Consolidated Edison of New York, Rochester Gas & Electric, Central Hudson

Project Type: Electric Transmission Systems

Equipment

- 39 Phasor Measurement Units
- 8 Phasor Data Concentrators
- Synchrophasor Communications Network
- Automated Capacitors

Advanced Applications

- Post-Mortem Analysis
- State Estimation
- Voltage Stability Monitoring

Key Targeted Benefits

- Improved Electric Service Reliability and Power Quality
- Optimized Generator Operation
- Reduced Costs from Line Losses
- Reduced Wide-Scale Blackouts

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- **State estimation** improves accuracy of power systems models for planning and operations.
- **Voltage stability monitoring** provides grid operators and engineers with detailed information about grid conditions and system stability.

Timeline

Key Milestones	Target Dates
SGIG project effective date	Q3 2010
PMU/PDC deployment start	Q2 2011
Capacitor deployment start	Q3 2011
Wide-area network communications infrastructure complete	Q1 2012
Phasor data acquisition / visualization / voltage stability monitoring applications testing begins	Q2 2012
Dynamic system model calibration study complete	Q4 2012
Controlled system separation study complete	Q4 2012
PMU/PDC deployment complete	Q4 2012
Capacitor deployment complete	Q1 2013
Implementation of visualization / voltage stability monitoring applications complete	Q1 2013
Implementation of phasor enhanced state estimator application complete	Q1 2013
SGIG project complete	Q2 2013

Contact Information

Kathleen Dalpe
Project Manager
New York Independent System Operator
kdalpe@nyiso.com